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Breast Cancer Incidence

1982-1992

Newton, Massachusetts

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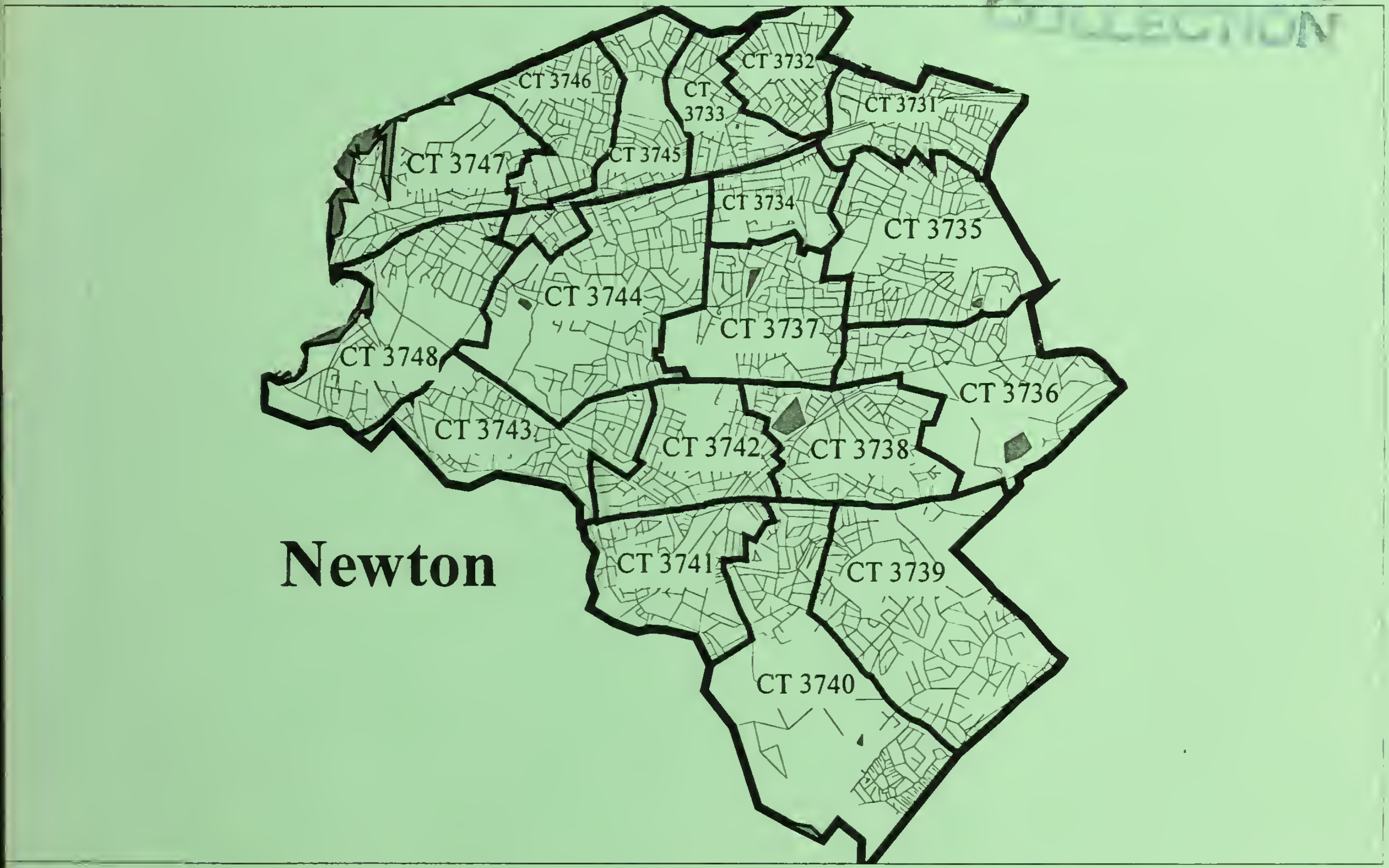

Prepared by the Massachusetts Department of Public Health

Bureau of Environmental Health Assessment

Community Assessment Unit

January 1997

Breast Cancer Incidence 1982-1992
Newton, Massachusetts

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Newton, Massachusetts

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I. Introduction

Data published by the Massachusetts Cancer Registry for the period 1982-1990 indicated that Newton experienced an excess in breast cancer cases that was statistically significant in comparison to the number of cases expected based on statewide rates of breast cancer (MDPH, 1993). In response to these findings, Massachusetts Senator Lois Pines requested further investigation on geographic and temporal trends occurring in Newton which resulted in this evaluation. Breast cancer incidence in Newton has been evaluated and factors which may play a role in the development of breast cancer have been examined.

The Community Assessment Unit (CAU) of the Bureau of Environmental Health Assessment (BEHA) investigated breast cancer incidence in each census tract in Newton, as well as for the city as a whole. Standardized Incidence Ratios (SIRs) were calculated for the periods 1982-1990, 1982-1992, 1982-1986, and 1987-1992 for breast cancer in Newton. The primary focus of this investigation was to evaluate the possible temporal or geographic trends and the possible role of risk factors including environmental factors, in breast cancer in Newton.

This investigation is descriptive in nature and can only provide a comparison of the incidence of breast cancer in Newton with the incidence of breast cancer in the state. Descriptive assessments have certain inherent limitations. Only routinely collected data are analyzed and information about personal risk factors (e.g., family history, hormonal events, diet), which may influence breast cancer incidence, is often limited and is not of an historical nature. It is beyond the scope of this investigation to determine any causal relationship or synergistic roles that the risk factors discussed in this report may have played in the development of breast cancer in Newton. The purpose of this investigation is to report our findings and discuss them in the context of the available information to determine whether further investigation is warranted.

II. Methods

Cancer incidence data for the years 1982-1992, 1982-1986, and 1987-1992 were obtained for the city of Newton from the Massachusetts Cancer Registry (MCR) of the Massachusetts Department of Public Health (MDPH) Bureau of Health Statistics, Research, and Evaluation. The MCR has been monitoring cancer incidence in the Commonwealth since 1982. The eleven year period 1982-1992 constitutes the period for which the most recent complete data were available at the time of analysis. Data for the years 1982-1990 were also analyzed to further assess the statistical elevation of breast cancer reported in the MCR publication "Cancer Incidence in Massachusetts 1982-1990" (MDPH, 1993).

To determine whether an elevated rate of breast cancer exists in each Newton census tract for the various time periods, cancer incidence data were adjusted by age and sex and analyzed to compare the actual (or observed) number of cases to the number that would be expected based on statewide breast cancer incidence.

In order to calculate incidence rates, it is necessary to obtain accurate population information. The population figures used in this analysis were interpolated based on 1980 and 1990 Census data for Massachusetts (US Bureau of Census, 1980, 1990). To estimate the population between census years, an assumption was made that the change in population occurs at a constant rate throughout the ten year interval between each census. From these calculations, 1986 and 1987 population estimates for the city of Newton were obtained. Population estimates for the year 1986 were used to calculate SIRs for the time period 1982-1990. Population estimates for the year 1987 were used to calculate SIRs for the time periods 1982-1992, 1982-1986 and 1987-1992.

An SIR is an estimate of the occurrence of disease in a population in relation to what might be expected if the population in question had the same cancer experience as some larger population designated as "normal" or average. Usually, the state as a whole is selected to be the "normal" population.

Specifically, an SIR is the ratio of the observed number of cancer incidence cases to the expected number of cases. An SIR of 100 indicates that the number of cancer cases in a given population is equal to the number of cases expected in a "normal" population. An SIR greater than 100 represents an increase in the number of cases, while an SIR less than 100 represents fewer cases than expected. For instance, an SIR of 150 is interpreted as 50 percent more cases than expected; an SIR of 90 indicates 10 percent fewer cases than expected.

Caution should be exercised when interpreting an SIR. The interpretation of an SIR depends on both the size and stability of the SIR itself. Two SIRs can have the same size but not have the same stability. An SIR of 150 based on two expected cases and three observed cases indicates a 50 percent excess in cancer, but this high percentage of excess is actually only one case, which may have occurred by chance alone. Conversely, an SIR of 150 based on 200 expected cases and 300 observed case shows the same 50 percent excess in cancer but because the SIR is based upon a greater number of cases, the estimate is more stable. It is unlikely that 100 excess cases of cancer would occur by chance alone.

To determine if the observed number of cases is significantly different from the expected number of cases or if the difference may only be due to chance, a 95 % Confidence Interval (CI) is calculated (Rothman and Boice, 1982). Statistical significance is not assessed when fewer than five cases are observed. A 95 % confidence interval is the range of estimated SIR values so that this range has a 95 % probability of including the true SIR for the population. If the range does not include 100, then this means that the study population is significantly different from the "normal" population and there is less than a five percent chance that the observed difference is merely the result of random fluctuation in the number of cancer cases. If the range excludes 100 and the observed SIR is greater than 100, the number of cancer cases is considered significantly higher than expected. Similarly, an observed SIR less than 100 indicates that the number of cancer cases is significantly lower than expected if the range excludes 100. If the range includes 100, then this means the true SIR may be 100 and we cannot conclude with sufficient confidence that the observed SIR reflects a real cancer excess (or deficit).

The width of the confidence interval reflects the stability of the SIR estimate. For example, a narrow confidence interval (e.g., 103 - 115) allows a fair level of certainty that the observed SIR is close to the true SIR value for the population. A wide interval (e.g., 82 - 450), on the other hand, leaves considerable room for doubt about what the true SIR is. That is, the true SIR could be much higher or much lower than the observed SIR.

In order to assess the geographic distribution of cases, place of residence at diagnosis was mapped for each individual. Such mapping allows for further refinement of the data contained in the MCR, which occasionally includes duplicate reports of a single case. This analysis accounts for these duplicate cases by removing duplicate cases of breast cancer while including multiple primary breast cancer cases. A multiple primary cancer case is defined by the MCR as a new cancer of the same histology as an earlier cancer, if diagnosed in the same site more than two months after the initial diagnosis (MCR, 1996). Duplicate cases are additional reports of the same primary cancer case.

III. Results

Tables 1 through 4 summarize breast cancer incidence in Newton and each of its census tracts for each of the time periods analyzed.

The observed number of breast cancer cases reported in this report for Newton are in some instances slightly different from the observed number of cases in the MCR report, *Cancer Incidence in Massachusetts 1982-1992 City and Town Supplement* (MDPH, 1995). The data contained in the MCR *City and Town Supplement* reflect information entered in the MCR computer files prior to the date this file was closed and made available for research. The data in this research file are constantly being quality controlled so that corrections may be made in subsequent reports. Occasionally, the research file may contain duplicate cases.

The data discussed here control for duplicate cases. The decision that a case was a duplicate and should be excluded from the analyses was made by the MCR after consulting with the reporting facilities and obtaining additional information regarding the histology and/or pathology of the case. The number of observed breast cancer cases reported here is lower than in *City and Town Supplement* because duplicate cases were not included in this analysis.

A. Previous Data 1982-1990

The MCR's original data for the period 1982-1990 highlight Newton as having a statistically significant elevation of breast cancer (MDPH, 1993). Female breast cancer incidence for the 1982 -1990 time period in Newton was statistically significantly elevated (SIR = 113; 95 % CI = [104 - 122]). There were 71 excess cases of female breast cancer observed in Newton during this time period (622 observed/ 550.7 expected). There were two excess cases of male breast cancer observed during this time frame (5 observed/ 3 expected). However, the male breast cancer elevation was not statistically significant (SIR=153; 95 % CI = [49-357]). Table 1 presents these findings.

CAU staff analyzed breast cancer incidence during this time period for smaller geographic units (i.e., census tracts). Significantly elevated female breast cancer rates occurred in four of the eighteen census tracts (i.e., census tracts 3737, 3740, 3743, and 3744) (see Table 1 and Figure 1).

B. Temporal Distribution

The MCR recently updated the cancer incidence data to include statistics for the years 1991 and 1992. This addition prompted an analysis of the entire eleven year period 1982-1992 (see Table 2). Analyzing the data in this manner helps to identify variations in incidence over time. A comparison of breast cancer incidence in Newton and its census tracts for the periods 1982-1986 and 1987-1992 is provided below. The SIRs for these time periods are provided in Tables 3 and 4. A detailed discussion of SIRs for each census tract for each time period evaluated is provided in Appendix A.

1982-1992

- Statistically significant elevations of female breast cancer were observed in Newton and in census tracts 3737, 3740, and 3743.
- There were 8 cases of male breast cancer observed in Newton while 4.3 were expected. This represents a non-statistically significant elevation (SIR=187; 95% CI=[80-368]).

1982-1986

- A statistically significant elevation of female breast cancer was observed in Newton (356 observed/ 286.8 expected; SIR=124; 95% CI=[112-138]).
- There were three cases of breast cancer in males observed in Newton. Statistical significance could not be evaluated due to the small number of cases.
- Statistically significant elevations of female breast cancer were observed in census tracts 3737 and 3744 (26 observed versus 14.3 expected; SIR=182; 95% CI=[119-266] and 37 observed versus 21.5 expected; SIR=172; 95% CI=[121-238]).
- Breast cancer among females was observed to be statistically significantly lower than expected in census tract 3746 (8 observed versus 17.1 expected; SIR=47; 95% CI=[20-92]).

1987-1992

- Female breast cancer in Newton occurred about as expected (406 observed versus 400.7 expected).

- There were five cases of breast cancer among males in Newton during this time period. While this represents an excess of two cases, the elevation was not found to be statistically significant.

- A statistically significant elevation of female breast cancer was observed in census tract 3738 (39 observed versus 27.5 expected; SIR=142; 95% CI=[101-194]).

C. Geographic Distribution

Review of the geographical distribution of breast cancer in Newton for each of the time periods evaluated indicates that the cases are evenly distributed within the census tracts even for those tracts where statistically significant elevations were observed. In some census tracts where cases appeared to be geographically concentrated, further examination showed that the apparent concentrations were located in areas of dense population or could be explained by the presence of a multi-unit living complex. In census tracts 3731, 3734 and 3737, the cases that constituted an apparent geographic concentration were characterized by a typical age distribution for breast cancer (i.e., most women were diagnosed after age 55).

D. Environmental Data

Under Chapter 21E (also known as the State Superfund) of the Massachusetts General Laws enacted in 1983, the Massachusetts Department of Environmental Protection (MDEP) investigates potentially hazardous sites in the state and conducts and oversees cleanup of these sites. According to the August 1993 MDEP publication "List of Confirmed Disposal Sites and Locations to be Investigated," there are nine 21E sites in the city of Newton, Massachusetts (MDEP, 1993). These confirmed 21E sites were mapped to determine their location in the city. A careful review of this information in relation to the cancer data indicates that there does not appear to be any unusual concentration of breast cancer cases in the vicinity of these sites.

E. Socioeconomic Status Data

Median household income was assessed as a surrogate measure of socioeconomic status for Newton's eighteen census tracts. Based on 1990 federal census data, the highest median household incomes in Newton were observed in census tracts 3737, 3743 and 3744. The three lowest median household incomes were observed in tracts 3731, 3732 and 3741. This information is presented in Table 5.

Breast cancer incidence among females was either statistically significantly elevated or elevated for all four time periods for tracts 3737 and 3743. Census tract 3744 experienced

statistically significant elevations for the 1982-1990 and 1982-1986 time periods. A non-statistically significant elevation was also observed in this census tract during 1982-1992. A slightly lower than expected incidence was observed in tract 3744 for the 1987-1992 time period.

The three census tracts with the lowest socioeconomic status did not experience consistently elevated breast cancer incidence. The incidence in census tracts 3731, 3732 and 3741 was essentially consistent with that expected for each time period. A lower than expected SIR was observed during the 1987-1992 time period in census tract 3731. However, a non-statistically significant elevation was observed during the 1982-1986 period in this tract.

Census tract 3746 presented with statistically significantly lower than expected rates for the 1982-1986 time period. Relative to other census tracts in Newton, this tract had the fifth lowest socioeconomic status.

These findings are generally consistent with the medical literature which states that higher socioeconomic status is correlated with risk factors for increased incidence of breast cancer.

F. Staging

Staging categorizes the extent of disease and its spread at the time of diagnosis. Survival with breast cancer correlates strongly with early stage cancer, especially with cancer limited to the breast (local or stage I). Screening improves the odds of breast cancer diagnosis at early stage. An evaluation of staging information can help to determine whether cancer patients in a given area are being diagnosed at early or late stage of disease. Such information can then be used to identify cancer patterns within communities where further public health intervention may be warranted. Staging information for breast cancer cases in Newton and the state of Massachusetts as a whole was examined to compare the stage at diagnosis. The stage of breast cancers by census tract was also examined.

This analysis categorizes stage as localized, regional, distant, or unknown. Localized breast cancer represents a diagnosis that the tumor is invasive but the cancer is confined to the breast. Regional indicates that the tumor has spread beyond the organ of origin (breast). This may include spread to adjacent tissues or organs, lymph nodes, or both. Distant indicates that the cancer has metastasized to organs other than those adjacent to the organ of origin, or to distant lymph nodes or both (MDPH, 1996). Some of the cases reported to the MCR are reported with an unknown stage. This indicates that at the time of reporting the tumor had not been staged.

This report only assesses breast cancer reported as localized, regional, distant, or unknown. In 1992, the MCR began collecting data regarding breast cancer cases categorized as in situ breast cancer. Cancer in situ is defined as malignant cells within the breast ductal-lobular system without evidence of invasion of neighboring tissues (Harris et. al., 1996). In situ cases of breast cancer have not been included in this report because these data are only available for 1992.

Massachusetts vs. Newton

Among Massachusetts breast cancer cases reported to the MCR during the eleven year time period 1982-1992, 58.1% of cases were reported as localized, 29.7% as regional, 6.3% as distant, and 5.8% as unknown. A similar distribution of stage at diagnosis was observed among breast cancer cases in Newton during this time period. In Newton, 58.8% (n=453) of the cases were diagnosed as localized cancers, 28.2% (n=217) as regional, 5.6% (n=43) as distant, and 7.4% (n=57) were unknown. These data are presented in Figure 2.

Examination of the stage at diagnosis for Newton and the state for the two time periods 1982-1986 and 1987-1992 showed that the distribution of cases in Newton by stage is very similar to that of the state. The percent of cases staged as local or early stage cancer was greater than later stage cases (regional or distant). The percent of local stage cases for Newton and the state were approximately 54% and 62% for the 1982-1986 and 1987-1992 time periods, respectively. Regional stage tumors composed approximately 31% to 32% of cases in Newton and the state for the time period 1982-1986. Distant stage tumors composed 7.2% to 7.7% of cases during this time. For the period 1987-1992, regional stage tumors composed approximately 26% to 28% of cases and distant stage tumors composed approximately 4.1% to 5.3% of cases. These data are presented in Figure 3.

Further, in Newton as well as the state, the percent of localized tumors increased, although only slightly, from the earlier to the later time period (54% versus 62% of cases). This increase in early stage cases most likely reflects the general increase in the use of screening from the 1980's to the 1990's. These data also indicate that the majority of the breast cancers diagnosed in Newton were diagnosed early and is an indication that most women diagnosed in this city had access to and sought screening.

Newton Census Tracts

Evaluation of staging by census tracts in Newton showed that overall there was a higher proportion of localized tumors as compared to regional or distant staged tumors during the entire 1982-1992 time period. When the distribution of staged cancers was examined for the two time periods 1982-1986 and 1987-1992, the majority of census tracts also presented with a greater proportion of localized than regional or distant breast cancers. During 1982-1986, census tract 3734 presented with a higher proportion of regional breast cancer and census tract 3738 had an equal percentage of localized and regional breast cancer. These data generally reflect the distribution observed in the city of Newton as well as the state, where a greater proportion of breast cancer cases were diagnosed as local or early stage. However, it should be noted that stage at diagnosis for a percentage of the cases was unknown. Examination of staging data for cases at the census tract level for each time period resulted in a small number of cases for some census tracts. If staging data were available for those cases categorized as unknown, the proportion of localized, regional, and distant breast cancers for some census tracts could significantly change. Breast cancer staging by time period for the Newton census tracts is presented in Table 6.

Improved diagnostic procedures, improved screening utilization, and improved knowledge may lead to an increase in the percent of localized disease over time. Therefore, an evaluation of staging for the earlier and later time periods was conducted to compare the change in stage in census tracts over time. In twelve of the eighteen census tracts, the percentage of localized breast cancer increased from 1982-1986 to 1987-1992. In addition, the percentage of distant or late stage breast cancers decreased in the later time period for the majority of census tracts. For those census tracts where the percent of distant stage cancers increased (i.e., census tracts 3735, 3741, 3742 and 3747), the total number of cases in these tracts was twenty or less.

Statistically significant elevations were observed consistently in census tracts 3737, 3740, and 3743. In these census tracts, localized breast cancer was diagnosed more often than regional or distant breast cancer in each time period. However, the cases with unknown stage make it difficult to determine if this is representative of the true staging distribution. If this distribution is accurate, it appears that screening practices are being utilized in the tracts with higher than expected rates of breast cancer.

Census tract 3746 presented with a statistically significantly lower than expected rate of breast cancer during the 1982-1986 period. There were eight cases diagnosed in this tract during this time period. Fifty percent of these cases were diagnosed as localized breast cancer while 25% were regional, and 25% were distant. Because 25% of these cases were diagnosed with distant disease it may initially appear that screening is underutilized in this tract. However, because of the small number of cases in this tract during this time period, it is difficult to determine whether screening is indeed being underutilized.

IV. Discussion

Statistically significant elevations of breast cancer were observed in census tracts 3737, 3740, 3743, and 3744 during the 1982-1990 time period. During the 1982-1992 time period three of these four census tracts (3737, 3740, and 3743) were also found to have statistically significant elevations.

Time trends were analyzed to determine if the incidence of female breast cancer in the city of Newton and the individual census tracts varied over time. Statistically significant elevations were observed for the city of Newton and for census tracts 3737 and 3744 for the time period 1982-1986. A statistically significantly lower incidence was also observed for census tract 3746 during the first time period. The second time period (1987-1992) showed a statistically significant elevation of breast cancer in census tract 3738. For the city as a whole female breast cancer occurred about as expected.

Tract 3744 experienced a statistically significant elevation for the 1982-1990 time period. This elevation occurred primarily because of a statistically significantly elevated incidence early in this time period. The latest time period (1987-1992) for census tract 3744 showed lower than expected incidence.

For the latest time period reviewed, 1987-1992, the only census tract with a statistically significant elevation was 3738. Other than the three census tracts 3737, 3740, and 3743, no other census tract for this time period had an elevation of more than two cases over that expected, and most of the census tracts reported fewer than expected cases. As a result, city-wide, female breast cancer occurred about as expected (406 observed/ 400.7 expected).

The fact that Newton experienced a statistically significant elevation of breast cancer from 1982-1986 and not from 1987-1992 suggests that the factors contributing to the increase in the earlier time may no longer be playing as large a role. The census tracts that were statistically significantly elevated in the first time period were not statistically significantly elevated in the second time period.

Although certain census tracts had higher than expected rates of breast cancer, analysis of the geographic distribution of breast cancer did not reveal any unusual concentrations of individual cases within any of the census tracts. Further, the evaluation of environmental data in relation to cancer cases did not suggest any unusual patterns. This observation lessens but does not rule out the chance for an environmental association with breast cancer in this community.

In order to explore other possible factors (i.e., sources of environmental concern other than 21E sites), MDPH contacted the Newton health department for information on the elevated census tracts (3737, 3740, and 3743). MDPH learned that no other known areas of environmental concern exist in these tracts.

Census tracts 3737, 3740, and 3743 appear to have the most consistent elevations of female breast cancer incidence in Newton across all time periods. Census tracts 3737 and 3743 also have two of three highest median incomes in Newton. Median income is one indicator of socioeconomic status, which correlates with risk factors for breast cancer.

In addition, evaluation of stage at diagnosis may provide an indication of the utilization of breast cancer screening in certain areas in Newton. For those census tracts with higher than expected rates of breast cancer, a greater proportion of local or early stage diagnoses could indicate that screening practices are being utilized more often in these areas than in other census tracts in Newton. A higher proportion of localized tumors as compared to regional or distant tumors were observed in these census tracts. However, the percent of early stage tumors observed in these three tracts were not comparatively greater than in other areas of Newton. Therefore, it is difficult to determine whether utilization of screening practices may have contributed to excess cancers observed in these areas. Further, the distribution of staging for cases in census tract 3746 where a significantly lower than expected rate of breast cancer was observed, demonstrated that a higher percentage of cases relative to other census tracts were diagnosed as distant or late stage of disease. However, the small number of cases in this census tract did not allow for a definitive determination as to whether breast cancer screening is underutilized in this area.

While age-adjusted mortality rates for breast cancer have remained constant since 1930, breast cancer incidence rates have been rising over the past several decades (Kelsey and

Gammon, 1990). The incidence of female breast cancer in Massachusetts has been increasing since 1982 with some leveling off occurring in the late 1980s (MDPH, 1993). A portion of this increase in incidence is likely attributed to early detection brought on by mammography utilization and self exam. However, improved detection is not apt to be the only factor associated with the increase in incidence rates. The identified risk factors account for less than half of the reported breast cancer cases in the United States, thus there is speculation concerning other potential risk factors (Flack, 1992).

According to the American Cancer Society (ACS, 1996), breast cancer is the second major cause of cancer deaths in women. Breast cancer deaths are surpassed only by lung cancer deaths in females. The American Cancer Society estimates that in 1996, 44,560 individuals will die of breast cancer (44,300 deaths in females, and 260 deaths among males). More cases of breast cancer in women are diagnosed each year than any other cancer (Kelsey and Gammon, 1991). There are several known risk factors for breast cancer and many that are under current investigation.

The risk of breast cancer in females increases over the age of 40 with the majority of cases occurring greater than age 50. The major known risk factors for breast cancer are attributed to genetics and hormones. A family history of breast cancer, early onset of menstruation, late age at menopause, never having had children, late age at first full term pregnancy, higher education, and higher socioeconomic status have been identified as risk factors for breast cancer in females. There appears to be some variation in risk factors depending upon pre / post menopausal status. Some studies indicate that obesity appears to be a risk factor in postmenopausal women while thin premenopausal women appear to be at a higher risk. Evidence from animal and human epidemiologic data suggest that dietary fat may play a key role in the development of breast cancer (Boyd et al., 1992). Previous studies have suggested that women of Jewish descent might have a higher rate of breast cancer than non-Jewish women (Kelsey and Gammon, 1991).

Higher socioeconomic status and higher education are believed to be correlated with risk factors for an increased risk of breast cancer. Possible explanations for this increased risk include over-nutrition and delayed childbearing in higher socioeconomic populations. The incidence may appear elevated in higher socioeconomic populations due to an increased detection rate. These populations may have better access to medical care and thus may be more likely to seek screening for breast cancer.

The risk of breast cancer is increased in women with a history of breast cancer, endometrial cancer, or ovarian cancer (Kelsey and Gammon, 1990). Women with a history of primary breast cancer are believed to have a three to four fold increase in the risk for primary cancer in the contralateral breast (Kelsey and Gammon. 1991).

The relationship between breast cancer and the use of hormones both for contraception and as menopausal replacement therapy, has been intensely studied. There is some evidence of an increased breast cancer risk in women who have used replacement estrogens. Long term replacement estrogen users seem to be at particular risk, although the available data are not

consistent. Recent metaanalyses (pooled studies) have suggested that the increased risk of breast cancer from estrogen replacement for a period of 5 to 10 years is nonexistent or extremely small. No conclusive evidence is available to link oral contraceptive use with increased risk of breast cancer (Page and Asire, 1985).

Women with family histories of breast cancer in close relatives have an increased risk of breast cancer. Recent scientific research has identified genes related to breast cancer. These genes are BRCA1, BRCA2, and p53, which can be inherited in forms capable of conferring increased breast cancer susceptibility. Typically, individuals are born with two copies of every gene. When a mutated form of one of these genes is inherited, there may be a marked increase in breast cancer susceptibility. These genes are believed to act as tumor suppressors (i.e., their function is to suppress the formation of tumors). If an individual inherits a mutation which alters its tumor suppressor capacity, only one copy of the tumor-suppressor gene is acting to suppress tumor formation. If this one active copy is then inactivated by a non-inherited event, the chance of developing cancer increases. Thus, women who inherit mutate versions of this gene are at higher risk of developing breast cancer than women who do not carry mutated versions of the gene (Harris et. al., 1996).

Ataxia-telangiectasia is an autosomal recessive genetic disorder, (i.e., a disorder which requires two defective genes). This disorder is characterized by cerebellar ataxia, oculocutaneous telangiectasias, radiation hypersensitivity, and an increased incidence of malignant disease. Preliminary observation indicate that women presumed to be heterozygous (inherit one defective copy and one nondefective copy of the gene) for ataxia-telangiectasia have excess breast cancer (Harris et al, 1996).

While definitive information about the role of environmental factors in breast cancer is not available, studies are currently underway to evaluate potential links between breast cancer and environmental factors such as pesticides and electromagnetic fields (Kelsey and Gammon, 1990; Falck, 1992). The primary environmental risk factor that has been identified in relation to breast cancer is exposure to ionizing radiation, as evidenced by follow-up studies of atomic bomb survivors. One recent study, conducted at the Mt. Sinai School of Medicine in New York, has explored a possible relationship between breast cancer and exposure to certain pesticides. This study, however, was of a preliminary nature, and not conclusive in its results (Wolff, 1993).

The BEHA is presently conducting research initiatives exploring a potential relationship between breast cancer and environmental agents, including a major study, conducted by a contractor to the MDPH, on the environment and breast cancer on Cape Cod and a pilot study conducted solely by MDPH staff in Berkshire County, Massachusetts, investigating changes in serum PCB and pesticide concentrations over time in breast cancer patients. The Berkshire study aims to provide important information on data gaps identified from the Mt. Sinai study by recruiting females within weeks of their diagnosis. The primary data gaps identified in the Mt. Sinai study included the recruitment of female breast cancer patients after diagnosis and treatment had been initiated. This raised the question of whether the association observed between diagnosis of breast cancer and body burdens of PCBs/DDE were an artifact related to physiologic change after diagnosis and treatment or whether the observed association was real.

Unlike breast cancer in females, breast cancer is relatively rare in males. Thus, there is not a strong understanding of the risk factors for male breast cancer. Breast cancer occurs at an older age in men than in women. Male breast cancer usually presents as a painless lump as is the case in females. According to Spatz et al, male breast cancer is 100 times less common than female breast cancer. However, the prognosis for male breast cancer cases is worse than the prognosis for female breast cancer cases. This is believed to be associated with delayed detection of male cases (Spatz, 1988).

The identified risk factors for male breast cancer include obesity, treatment for inguinal hernias, gonadal injury, a history of gynecomastia (enlargement of the breasts), family history of breast cancer among first degree relatives, drug treatment associated with prolactin elevations, radiation treatment, and states of hyperestrogenism such as Klinefelter's syndrome, a genetic condition in which males present with an extra sex chromosome (Ollsson and Ranstam, 1988). However, there is insufficient information to causatively associate these risk factors with male breast cancer

V. Limitations

Descriptive epidemiologic investigations have certain limitations which should be considered when interpreting these data. For this investigation, only routinely collected data were analyzed. Therefore, no detailed information on personal risk factors which may have contributed to the incidence of breast cancer in Newton was included. For instance, familial factors such as genetics and family history or information regarding dietary factors that influence the risk of developing breast cancer were not available for inclusion in this report. Other data limitations include the possibility of missing cases, non-historical data, and misclassification of residence. The MCR estimates that the data file for the years 1982-1992 contains 90% of all reportable cases. Historical data were not available, therefore an evaluation of past factors that may be attributing to the risk of disease was not possible.

VI. Conclusions

This analysis was conducted as a descriptive investigation of cancer incidence in the city of Newton. This analysis can only provide an evaluation of cancer incidence in the city or by census tract in comparison to cancer incidence in the Commonwealth for the various time periods.

Overall, Newton experienced a statistically significant elevation in female breast cancer during the entire eleven year period, 1982-1992. However, when analyzed by two smaller time periods (1982-1986 and 1987-1992), the significant elevation was seen only in the earlier time period. During the most recent time period, Newton experienced about the expected number of female breast cancer cases.

When examined by smaller geographic units (i.e., census tract), census tracts 3737, 3740, and 3743 appear to have the most consistent elevations in female breast cancer incidence across all time periods. Two of these census tracts also are among the top three census tracts in Newton with the highest median incomes, a measure of socioeconomic status, which correlates with risk factors for breast cancer. However, none of these census tracts had statistically significant elevations for the most recent time period, 1987-1992. Only census tract 3738 had a significant elevation in female breast cancer in the most recent period.

A greater proportion of localized or early stage tumors were observed in those census tracts with higher than expected rates of breast cancer. However, the percent of early stage breast cancers in these tracts were not comparatively greater than in other areas of Newton. In census tract 3746, a higher percentage of cases were diagnosed as distant or late stage of disease. This census tract also experienced a significantly lower than expected incidence of breast cancer. However, the small number of cases in this census tract did not allow for a definitive determination as to whether breast cancer screening is underutilized in this area.

Geographic analysis did not reveal any unusual concentration of cases in any particular part of Newton, including near areas that have been designated as state hazardous waste sites (i.e., 21E sites) by the MDEP.

Limitations in available data make it impossible to determine the precise causal relationships or synergistic roles that may have played a part in the development of breast cancer in Newton. However, based upon the data evaluated in this assessment, it is unlikely that environmental factors played a major role in the development of these cancers.

VII. Recommendations

The Community Assessment Unit of the Massachusetts Department of Public Health will continue to monitor breast cancer incidence in the city of Newton through the Massachusetts Cancer Registry.

Consistent elevations of breast cancer incidence were observed in census tracts 3737, 3740, and 3743. These tracts were found to be of higher socioeconomic status. These finding should be provided to the MDPH breast cancer research program for consideration of further study.

Despite the small number of cases in census tract 3746, where the incidence of breast cancer was reported to be significantly lower than expected, the need for intervention efforts should be considered.

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Figures

Figure 1: Census Tract Locations in Newton, MA
Figure 2: Breast Cancer Staging, Massachusetts vs. Newton 1982-1992
Figure 3: Breast Cancer Staging, Massachusetts vs. Newton 1982-1986 and 1987-1992

Figure 1

Census Tract Locations in Newton, MA

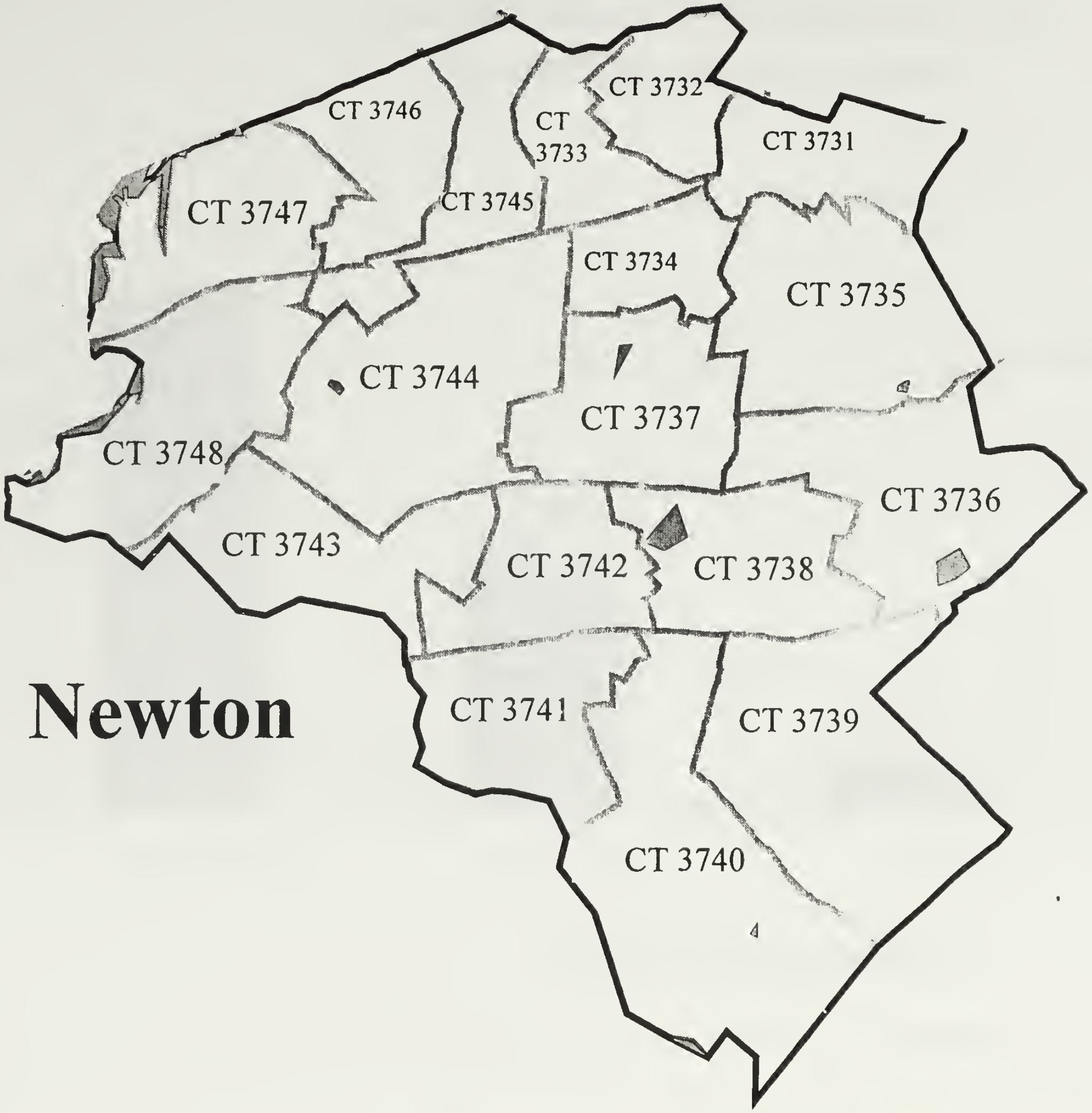


Figure 2
Breast Cancer Staging 1982-1992
Massachusetts vs. Newton

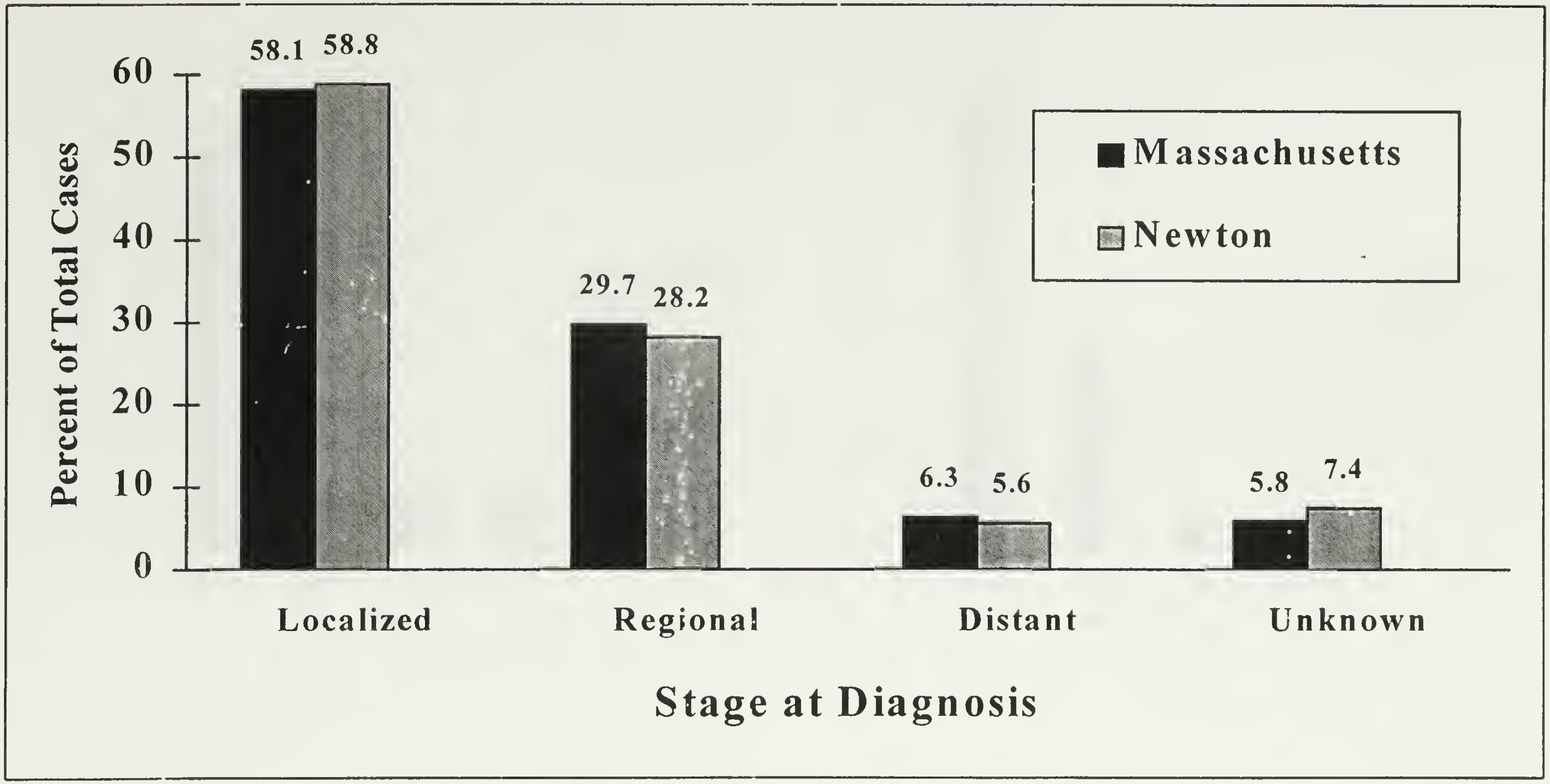
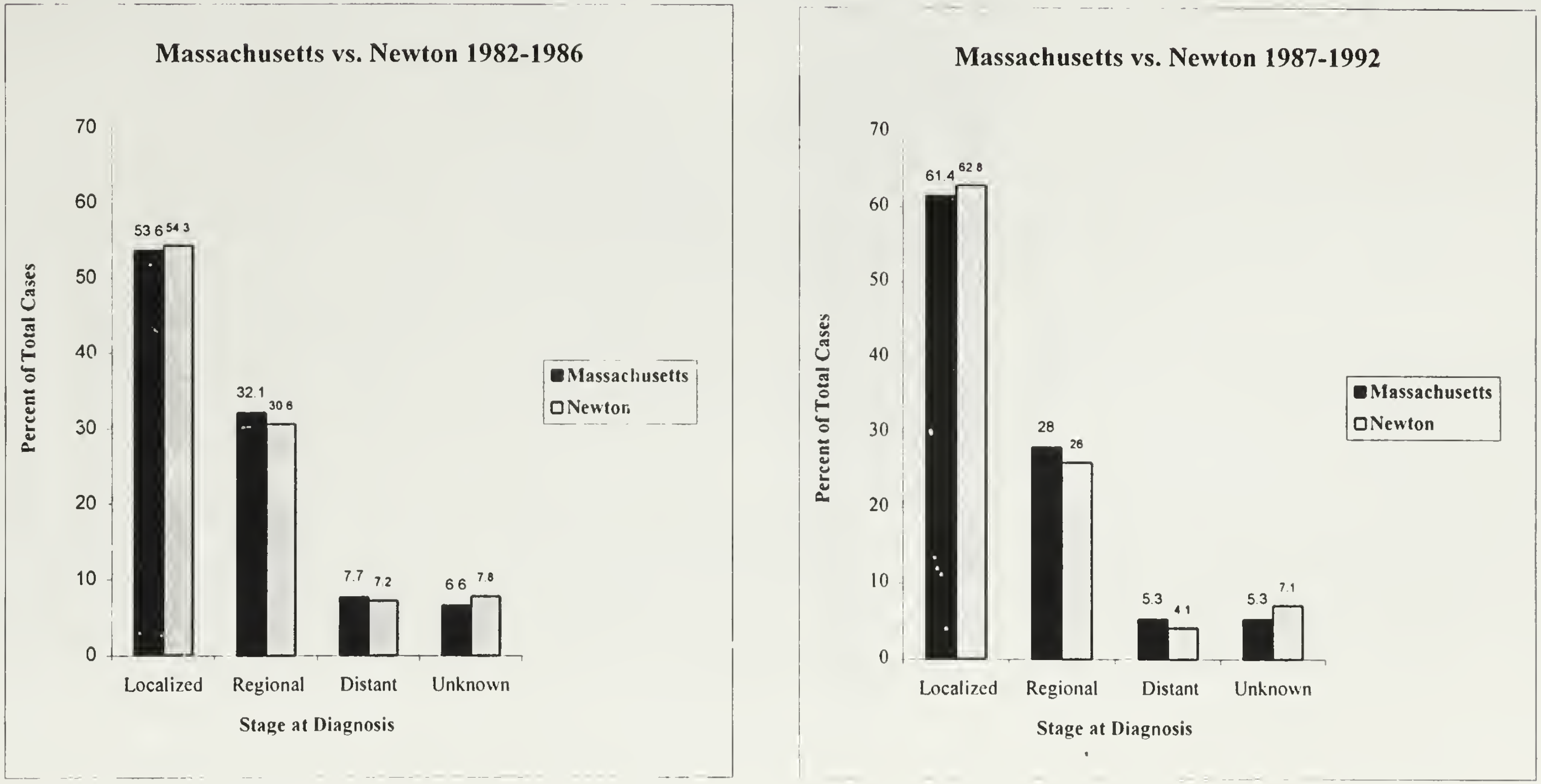


Figure 3
Breast Cancer Staging 1982-1986 and 1987-1992
Massachusetts vs. Newton



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Appendices

Appendix A: Breast Cancer Incidence by Time Period for Census Tracts in Newton, MA

Table 1
Breast Cancer Incidence in Newton, MA 1982-1990

Census Tract	Total				Male				Female			
	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI
3731	31	31.7	98	66 -- 139	1	0.2	617	NC	30	31.6	95	64 -- 136
3732	34	33.0	103	71 -- 144	1	0.2	551	NC	33	32.8	100	69 -- 141
3733	22	22.8	97	60 -- 146	0	0.1	-	NC	22	22.7	97	61 -- 147
3734	26	19.1	136	89 -- 200	1	0.1	979	NC	25	19.0	132	85 -- 194
3735	37	36.9	100	71 -- 138	1	0.2	439	NC	36	36.7	98	69 -- 136
3736	41	33.3	123	88 -- 167	0	0.2	-	NC	41	33.1	124	89 -- 168
3737	41	28.1	146	* 105 -- 198	1	0.2	565	NC	40	27.9	143	* 102 -- 195
3738	40	38.2	105	75 -- 143	0	0.2	-	NC	40	38.0	105	75 -- 143
3739	55	44.3	124	93 -- 162	0	0.3	-	NC	55	44.0	125	94 -- 163
3740	48	32.6	147	* 109 -- 195	0	0.2	-	NC	48	32.4	148	* 109 -- 197
3741	28	26.9	104	69 -- 151	0	0.1	-	NC	28	26.7	105	70 -- 151
3742	31	27.8	112	76 -- 158	0	0.2	-	NC	31	27.6	112	76 -- 159
3743	37	22.5	165	* 116 -- 227	0	0.2	-	NC	37	22.3	166	* 117 -- 228
3744	57	40.9	140	* 106 -- 181	0	0.2	-	NC	57	40.6	140	* 106 -- 182
3745	28	33.4	84	56 -- 121	0	0.2	-	NC	28	33.2	84	56 -- 122
3746	22	33.1	66	42 -- 101	0	0.2	-	NC	22	32.9	67	42 -- 101
3747	26	30.4	86	56 -- 126	0	0.2	-	NC	26	30.2	86	56 -- 126
3748	23	26.7	86	55 -- 129	0	0.1	-	NC	23	26.6	87	55 -- 130
Newton	627	554.0	113	* 104 -- 122	5	3.3	153	49 -- 357	622	550.7	113	* 104 -- 122

NOTE: Expected numbers of cases are rounded to the nearest tenth. SIRs are based on the exact number of expected cases.
Obs = Observed number of cases
Exp = Expected number of cases
SIR = Standardized Incidence Ratio
NC = Not Calculated when observed < 5.
* = Statistical Significance
95 % CI = 95 % Confidence Interval

Data source: Massachusetts Cancer Registry; Bureau of Health Statistics, Research and Evaluation; Massachusetts Department of Public Health

Table 2
Breast Cancer Incidence in Newton, MA 1982-1992

Census Tract	Total				Male				Female			
	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI
3731	38	39.0	97	69 -- 134	1	0.2	479	NC	37	38.8	95	67 -- 131
3732	43	41.0	105	76 -- 141	1	0.2	424	NC	42	40.8	103	74 -- 139
3733	26	28.3	92	60 -- 135	0	0.1	-	NC	26	28.1	92	60 -- 135
3734	27	23.7	114	75 -- 166	1	0.1	754	NC	26	23.6	110	72 -- 161
3735	44	46.5	95	69 -- 127	2	0.3	674	NC	42	46.2	91	66 -- 123
3736	48	41.5	116	85 -- 153	0	0.3	-	NC	48	41.2	116	86 -- 154
3737	53	34.6	153 *	115 -- 200	1	0.2	439	NC	52	34.4	151 *	113 -- 198
3738	61	47.5	128	98 -- 165	1	0.3	363	NC	60	47.3	127	97 -- 163
3739	68	57.1	119	93 -- 151	0	0.4	-	NC	68	56.7	120	93 -- 152
3740	57	42.0	136 *	103 -- 176	0	0.3	-	NC	57	41.7	137 *	104 -- 177
3741	34	33.8	101	70 -- 141	0	0.2	-	NC	34	33.6	101	70 -- 141
3742	37	34.8	106	75 -- 147	0	0.2	-	NC	37	34.5	107	76 -- 148
3743	43	28.0	154 *	111 -- 207	0	0.2	-	NC	43	27.8	155 *	112 -- 209
3744	64	51.4	125	96 -- 159	0	0.3	-	NC	64	51.1	125	97 -- 160
3745	33	41.9	79	54 -- 111	0	0.2	-	NC	33	41.7	79	55 -- 111
3746	33	41.4	80	55 -- 112	1	0.3	389	NC	32	41.2	78	53 -- 110
3747	31	38.0	82	55 -- 116	0	0.2	-	NC	31	37.8	82	56 -- 116
3748	30	33.6	89	60 -- 128	0	0.2	-	NC	30	33.4	90	61 -- 128
Newton	770	692.8	111 *	103 -- 119	8	4.3	187	80 -- 368	762	688.5	111 *	103 -- 119

NOTE: Expected numbers of cases are rounded to the nearest tenth. SIRs are based on the exact number of expected cases.
Obs = Observed number of cases
Exp = Expected number of cases
SIR = Standardized Incidence Ratio
NC = Not Calculated when observed < 5.
* = Statistical Significance
95 % CI = 95 % Confidence Interval

Data source: Massachusetts Cancer Registry; Bureau of Health Statistics, Research and Evaluation; Massachusetts Department of Public Health

Table 3
Breast Cancer Incidence in Newton, MA 1982-1986

Census	Total				Male				Female			
Tract	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI
3731	21	16.2	129	80 -- 198	1	0.1	1242	NC	20	16.1	124	76 -- 191
3732	18	17.1	106	63 -- 167	1	0.1	1122	NC	17	17.0	100	58 -- 160
3733	13	11.8	110	59 -- 188	0	0.1	-	NC	13	11.7	111	59 -- 189
3734	12	9.9	122	63 -- 213	0	0.1	-	NC	12	9.8	122	63 -- 214
3735	25	19.3	130	84 -- 192	0	0.1	-	NC	25	19.1	131	85 -- 193
3736	24	17.3	139	89 -- 207	0	0.1	-	NC	24	17.2	140	89 -- 208
3737	27	14.4	187	* 124 -- 273	1	0.1	1131	NC	26	14.3	182	* 119 -- 266
3738	21	19.8	106	66 -- 162	0	0.1	-	NC	21	19.7	107	66 -- 163
3739	33	23.7	139	96 -- 195	0	0.2	-	NC	33	23.6	140	96 -- 197
3740	25	17.4	144	93 -- 212	0	0.1	-	NC	25	17.3	145	94 -- 214
3741	15	14.1	106	59 -- 175	0	0.1	-	NC	15	14.0	107	60 -- 176
3742	17	14.4	118	69 -- 189	0	0.1	-	NC	17	14.3	118	69 -- 190
3743	19	11.6	164	99 -- 256	0	0.1	-	NC	19	11.5	165	99 -- 258
3744	37	21.6	171	* 121 -- 236	0	0.1	-	NC	37	21.5	172	* 121 -- 238
3745	17	17.6	97	56 -- 155	0	0.1	-	NC	17	17.5	97	57 -- 156
3746	8	17.2	47	* 20 -- 92	0	0.1	-	NC	8	17.1	47	* 20 -- 92
3747	12	15.8	76	39 -- 132	0	0.1	-	NC	12	15.8	76	39 -- 133
3748	15	14.1	106	59 -- 175	0	0.1	-	NC	15	14.1	107	60 -- 176
Newton	359	288.4	124	* 112 -- 138	3	1.6	183	NC	356	286.8	124	* 112 -- 138

NOTE: Expected numbers of cases are rounded to the nearest tenth. SIRs are based on the exact number of expected cases.

Obs = Observed number of cases

Exp = Expected number of cases

SIR = Standardized Incidence Ratio

NC = Not Calculated when observed < 5.

* = Statistical Significance

95 % CI = 95 % Confidence Interval

Data source: Massachusetts Cancer Registry; Bureau of Health Statistics, Research and Evaluation; Massachusetts Department of Public Health

Table 4
Breast Cancer Incidence in Newton, MA 1987-1992

Census Tract	Total				Male				Female			
	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI	Obs	Exp	SIR	95% CI
3731	17	22.7	75	44 -- 120	0	0.1	-	NC	17	22.6	75	44 -- 120
3732	25	23.9	105	68 -- 154	0	0.1	-	NC	25	23.8	105	68 -- 155
3733	13	16.4	79	42 -- 135	0	0.1	-	NC	13	16.3	80	42 -- 136
3734	15	13.8	108	61 -- 179	1	0.1	1245	NC	14	13.8	102	56 -- 171
3735	19	27.2	70	42 -- 109	2	0.2	1114	NC	17	27.0	63	37 -- 101
3736	24	24.1	100	64 -- 148	0	0.2	-	NC	24	23.9	100	64 -- 149
3737	26	20.2	129	84 -- 189	0	0.1	-	NC	26	20.0	130	85 -- 190
3738	40	27.7	145	* 103 -- 197	1	0.2	590	NC	39	27.5	142	* 101 -- 194
3739	35	33.3	105	73 -- 146	0	0.3	-	NC	35	33.1	106	74 -- 147
3740	32	24.6	130	89 -- 184	0	0.2	-	NC	32	24.4	131	90 -- 185
3741	19	19.6	97	58 -- 151	0	0.1	-	NC	19	19.5	97	59 -- 152
3742	20	20.3	99	60 -- 152	0	0.1	-	NC	20	20.1	99	61 -- 153
3743	24	16.4	147	94 -- 218	0	0.1	-	NC	24	16.2	148	95 -- 220
3744	27	29.7	91	60 -- 132	0	0.2	-	NC	27	29.5	91	60 -- 133
3745	16	24.2	66	38 -- 107	0	0.1	-	NC	16	24.1	66	38 -- 108
3746	25	24.2	103	67 -- 153	1	0.2	629	NC	24	24.0	100	64 -- 149
3747	19	22.1	86	52 -- 134	0	0.1	-	NC	19	22.0	86	52 -- 135
3748	15	19.4	77	43 -- 128	0	0.1	-	NC	15	19.3	78	44 -- 128
Newton	411	403.4	102	92 -- 112	5	2.6	191	62 -- 447	406	400.7	101	92 -- 112

NOTE: Expected numbers of cases are rounded to the nearest tenth. SiRs are based on the exact number of expected cases.

Obs = Observed number of cases
Exp = Expected number of cases
SIR = Standardized Incidence Ratio
NC = Not Calculated when observed < 5.
* = Statistical Significance
95 % CI = 95 % Confidence Interval

Data source: Massachusetts Cancer Registry; Bureau of Health Statistics, Research and Evaluation; Massachusetts Department of Public Health

Table 5

Median Household Income for Selected Census Tracts in Newton, MA

		Breast Cancer Incidence in Newton			
Census Tract	Median Household Income	1982-1990	1982-1992	1982-1986	1987-1992
3743	$97,903	↑*	↑*	↑	↑
3744	$86,150	↑*	↑	↑*	↓
3737	$82,640	↑*	↑*	↑*	↑
3731	$48,125	—	—	↑	↓
3741	$44,288	—	—	↑	—
3732	$41,157	—	—	↑	—

Note:

—	SIR consistent with expected (SIR=95-105)
↑*	SIR statistically significantly elevated
↑	SIR elevated
↓	SIR lower than expected

Data Source: US Department of Commerce. 1990 Census of Population: General Population Characteristics Massachusetts, Massachusetts. Washington DC: US Govt Printing Office.

Table 6
Breast Cancer Staging for Census Tracts in Newton, Massachusetts

	1982-1992 % Staging				1982-1986 % Staging				1987-1992 % Staging			
Census Tract	**Local**	**Regional**	**Distant**	**Unknown**	**Local**	**Regional**	**Distant**	**Unknown**	**Local**	**Regional**	**Distant**	**Unknown**
3731	44.7	36.8	10.5	7.9	42.9	38.1	19.0	0.0	47.1	35.3	0.0	17.6
3732	67.4	27.9	0.0	4.7	61.1	33.3	0.0	5.6	72.0	24.0	0.0	4.0
3733	65.4	19.2	3.8	11.5	61.5	7.7	7.7	23.1	69.2	30.8	0.0	0.0
3734	44.4	33.3	11.1	11.1	25.0	33.3	16.7	25.0	60.0	33.3	6.7	0.0
3735	59.1	27.3	6.8	6.8	56.0	36.0	8.0	0.0	63.2	15.8	5.3	15.8
3736	58.3	27.1	6.3	8.3	54.2	25.0	8.3	12.5	62.5	29.2	4.2	4.2
3737	54.7	32.1	1.9	11.3	55.6	25.9	3.7	14.8	53.8	38.5	0.0	7.7
3738	63.9	26.2	4.9	4.9	42.9	42.9	4.8	9.5	75.0	17.5	5.0	2.5
3739	61.8	27.9	4.4	5.9	57.6	30.3	3.0	9.1	65.7	25.7	5.7	2.9
3740	57.9	26.3	3.5	12.3	48.0	36.0	8.0	8.0	65.6	18.8	0.0	15.6
3741	58.8	26.5	11.8	2.9	73.3	20.0	6.7	0.0	47.4	31.6	15.8	5.3
3742	67.6	18.9	8.1	5.4	70.6	17.6	11.8	0.0	65.0	20.0	5.0	10.0
3743	53.5	34.9	4.7	7.0	52.6	31.6	10.5	5.3	54.2	37.5	0.0	8.3
3744	57.8	31.3	4.7	6.3	59.5	29.7	8.1	2.7	55.6	33.3	0.0	11.1
3745	63.6	24.2	3.0	9.1	47.1	41.2	0.0	11.8	81.3	6.3	6.3	6.3
3746	54.5	27.3	9.1	9.1	50.0	25.0	25.0	0.0	56.0	28.0	4.0	12.0
3747	54.8	29.0	12.9	3.2	58.3	33.3	0.0	8.3	52.6	26.3	21.1	0.0
3748	66.7	26.7	0.0	6.7	53.3	33.3	0.0	13.3	80.0	20.0	0.0	0.0
Newton	58.8	28.2	5.6	7.4	54.3	30.6	7.2	7.8	62.8	26.0	4.1	7.1

Local = confined to the breast
Regional = spread beyond the breast to adjacent organs/ tissues, lymph nodes
Distant = spread to organs other than those adjacent, distant lymph
Unknown = no stage reported to the MCR

Note: Refer to Tables 3 and 4 to obtain the number of observed cases in each census tract

Appendices

Appendix A: Breast Cancer Incidence by Time Period for Census Tracts in Newton, MA

Appendix A

Breast Cancer Incidence by Time Period for Census Tracts in Newton, MA

A. 1982-1990

Census Tract 3731

The incidence of breast cancer in census tract 3731 occurred at essentially the rate that was expected for this time period. There were 30 female cases of breast cancer observed in this census tract between 1982 and 1990 while 31.6 were expected (SIR = 95.1; 95 % CI = [64.1-135.7]). One male breast cancer case occurred in this census tract. This represents an elevated incidence of male breast cancer over the expected rate of 0.16. Due to the fact that only one male case was observed, a confidence interval could not be calculated. The male and female combined incidence was also consistent with what was expected (31 observed/ 31.7 expected; SIR = 97.7; 95 % CI = [66.4 - 138.7].

Census Tract 3732

In census tract 3732, breast cancer occurred at essentially the rate that was expected between 1982 and 1990. The SIR was determined to be 102.9 which does not represents a statistically significant elevation or decrease in the level of breast cancer. One male case was reported in this census tract. The female incidence of breast cancer was consistent with what was expected, 33 cases observed compared to 32.8 expected cases. The female SIR for breast cancer in this census tract was 100.5 (95 % CI = [69.1 - 141.1]).

Census Tract 3733

The incidence of breast cancer in census tract 3733 was observed to be consistent with what was expected, no statistically significant findings were observed. There were 22 cases observed and 22.8 cases expected during the years 1982-1990 (SIR = 96.5; 95 % CI = [60.5 - 146.1]). There were no male breast cancer cases in this census tract. The female incidence was also consistent with the expected incidence of breast cancer in census tract 3733 (SIR = 97.0; 95 % CI = [60.8 - 146.8]).

Census Tract 3734

The combined incidence in census tract 3734 for this time period was slightly elevated (26 observed/ 19.1 expected; SIR = 136.2) however, this was not found to be a statistically significant elevation (95 % CI = [88.9 - 199.6]. One male case was reported (1 observed/ 0.10 expected). The elevated female breast cancer incidence in this census

tract was also found not to be statistically significant (25 observed/ 18.9 expected; SIR = 131.7; 95 % CI = [85.2 - 194.4]).

Census Tract 3735

In census tract 3735, the observed male and female incidence was equivalent to that which was expected based on state rates for the period 1982-1990. The combined SIR was 100.2 (37 observed/ 36.9 expected; 95 % CI = [70.5 - 138.1]). There was one male breast cancer case observed. When the female incidence was examined separately, the SIR was determined to be 98.1 (36 observed/ 36.7 expected; 95 % CI = [68.7 - 135.8]). This does not represent a statistically significant decrease in breast cancer incidence.

Census Tract 3736

The elevation observed in census tract 3736 was due to an excess of eight cases and was not statistically significant (41 observed/ 33.3 expected; SIR = 122.9; 95 % CI = [88.3 - 166.9]). No male breast cancer cases were observed in this census tract during this time period. The incidence of breast cancer for females in this tract was consistent with that of the entire tract (41 observed/ 33.1 expected; SIR = 123.8; 95 % CI = [88.8 - 167.9]).

Census Tract 3737

A statistically significant elevation of 46.1 percent was observed in census tract 3737 for male and female breast cancer (41 observed/ 28.1 expected; SIR = 146.1; 95 % CI = [104.9 - 198.3]). One male case was observed (1 observed/ 0.018 expected). Approximately twelve excess cases of female breast cancer were observed during this time period in this census tract (40 observed/ 27.9 expected; SIR = 143.5; 95 % CI = [102.5 - 195.4]). The elevation of female breast cancer was statistically significant.

Census Tract 3738

The elevation observed in this census tract is based on an excess of two cases and was not statistically significant (SIR = 104.7; 95 % CI = [74.8 - 142.6]). The female incidence was also consistent with the expected rate of breast cancer in census tract 3738 (40 observed/ 38 expected; SIR = 105.3; 95 % CI = [75.2 - 143.4]). There were not any statistically significant findings in this tract for the years 1982-1990.

Census Tract 3739

Elevations of breast cancer were noted for female breast cancer and for overall breast cancer in this census tract for the period 1982-1990. These elevations, however, were not statistically significant. There were eleven excess cases of breast cancer

observed among females in census tract 3739 (55 observed/ 44.0 expected; SIR = 124.9; 95 % CI = [94.1 - 162.6]).

Census Tract 3740

Census tract 3740 experienced a statistically significant elevation of total breast cancer and female breast cancer. In total, 48 cases were observed while only 32.6 were expected (SIR = 147.3). This represents an increased incidence of 47 percent (95 % CI = 108.6 - 195.4). The SIR for female breast cancer was 148.3, representing a 48 percent elevation for the 1982-1990 time period.

Census Tract 3741

Breast cancer incidence in census tract 3741 during the period 1982-1990 occurred at essentially the rate that was expected, 28 observed cases and 26.9 expected cases (SIR = 104.2; 95 % CI = [69.2 - 150.6]). The number of cases among females was also found to be consistent with the expected female breast cancer rate (28 observed/ 26.7 expected; SIR = 104.7; 95 % CI = [69.6 - 151.3]). There were no male breast cancer cases observed in this census tract during this period.

Census Tract 3742

No statistically significant findings were noted in census tract 3742. The elevations that were observed were based on three excess cases. Therefore, the total breast cancer incidence appears to be elevated by 11.5 percent (31 observed/ 27.8 expected; SIR = 111.5; 95 % CI = [75.8 - 158.3]). Females experience breast cancer at a rate 12 percent higher than expected but this too was not a statistically significant finding (31 observed/ 27.6 expected; SIR = 112.2; 95 % CI = [76.2 - 159.3]).

Census Tract 3743

The female breast cancer incidence and the total breast cancer incidence in this census tract were determined to be significantly elevated for the years 1982-1990. The female breast cancer incidence was elevated by 65.7 percent. This 65.7 % increase represents an excess of 15 female cases (37 observed/ 22.3 expected; SIR = 165.7; 95 % CI = [116.7 - 228.4]). No male breast cancer cases were reported in this census tract during this time span. The overall incidence in this census tract was elevated by 64.6 percent (37 observed/ 22.5 expected; SIR = 164.6; 95 % CI = [115.9 - 226.9]).

Census Tract 3744

The elevation in incidence for census tract 3744 was noted to be statistically significant. The total incidence in this tract was elevated by 39.5 percent, sixteen additional cases were observed (95 % CI = [105.7 - 180.7]). Upon evaluating the female breast cancer incidence in this tract, the results are comparable to that of the total

incidence. The female SIR was determined to be 140.3, representing a 40 percent greater breast cancer incidence (95 % CI = [106.3 - 181.8]). There were no male breast cancer cases reported in this census tract during this time period.

Census Tract 3745

In census tract 3745, fewer cases of breast cancer were observed than expected for the 1982-1990 period, however, not statistically significantly. In total, 28 cases of breast cancer were observed while 33.4 cases were expected (SIR = 83.8; 95 % CI = [55.7 - 121.1]). Female breast cancer incidence was similar to the total incidence in this census tract during this nine year period (28 observed/ 33.2 expected; SIR = 84.3; 95 % CI = [56.0 - 121.8]).

Census Tract 3746

Census tract 3746 presented with eleven fewer cases of breast cancer than expected. This finding is of borderline significance (22 observed/ 33.1 expected; SIR = 66.4; 95 % CI = [41.6 - 100.6]). Female breast cancer incidence also was found to be of borderline significance (22 observed/ 32.9 expected; SIR = 66.8; 95 % CI = [41.9 - 101.2]).

Census Tract 3747

In census tract 3747, four fewer cases were observed than what was expected between 1982 and 1990 (26 observed/ 30.4 expected). The total SIR was 85.7, however, this does not represent a statistically significant finding (95 % CI = [55.9 - 125.5]). The incidence rate for females also appears to be lower than expected but this too was not statistically significant (26 observed/ 30.2 expected; SIR = 86.1; 95 % CI = [56.2 - 126.2]).

Census Tract 3748

Census tract 3748 presented with an incidence rate fourteen percent less than expected (23 observed/ 26.7 expected; SIR = 86.1). This finding was not statistically significant, 95 % CI = [54.6 - 129.2]. There were no statistically significant findings observed for female breast cancer incidence in this census tract for the years 1982-1990 (SIR = 86.6; 95 % CI = [54.9 - 129.9]).

B. 1982 - 1992

Census Tract 3731

Census tract 3731 experienced breast cancer at essentially the same rate as was expected for this time period. There was one less case than expected in this census tract (38 observed/ 39 expected; SIR = 97.3; 95 % CI = [68.9 - 133.6]). Similar findings were observed when female cases were considered separately. The SIR for females was 95.3. This represents approximately 2 fewer female cases over the expected (37 observed/ 38.8 expected; 95 % CI = [67.1 - 131.3]). One male breast cancer case was reported in this census tract during this time period.

Census Tract 3732

In census tract 3732, two excess cases were observed during the 1982-1992 time period. This represents an excess of 4.8 percent over the expected 41 cases. This excess was not determined to be of statistical significance. There was one male breast cancer case observed in this census tract. The female breast cancer incidence is consistent with that which was expected for this time period (42 observed/ 40.8 expected; SIR = 102.9; 95 % CI = [74.2 - 139.1]).

Census Tract 3733

There were no male breast cancer cases reported during the 1982-1992 time frame for census tract 3733. There were 2 fewer breast cancer cases observed among females than expected in this census tract. However, this decrease was not statistically significant and therefore may be the result of random fluctuation (26 observed/ 28.1 expected; SIR = 92.4; 95 % CI = [60.3 - 135.4]).

Census Tract 3734

In total, there were 27 cases of breast cancer observed in census tract 3734. This represents 3.3 excess cases over the expected 23.7 cases. This excess was not determined to be statistically significant (SIR = 113.7; 95 % CI = [74.9 - 165.5]). There was one case of breast cancer reported for males in this census tract.

Census Tract 3735

The incidence of breast cancer was slightly lower than expected in census tract 3735 during the 1982-1992 time frame. There were 44 cases observed and 46.5 cases expected, representing an SIR of 94.6. Which was not found to be statistically significant (95 % CI = [68.7 - 127.0]). There were two male breast cancer cases observed in this census tract while 0.29 were expected. Statistical significance for male breast cancer incidence could not be assessed due to the small number of observed cases. There were

nearly 4 fewer female cases of breast cancer in census tract 3735 during this eleven year period (42 observed/ 46.2 expected; SIR = 90.9).

Census Tract 3736

Census tract 3736 experienced breast cancer above the rate that was expected for the 1982-1992 time period. There were 48 female cases of breast cancer observed and no male cases observed. This represents 6.5 additional cases over the 41.5 expected. The overall SIR was determined to be 115.7. This is a non-statistically significant elevation (95 % CI = [85.3 - 153.4]).

Census Tract 3737

Census tract 3737 experienced a statistically significant elevation of breast cancer for females and for overall incidence. There were 53 cases observed while 34.6 were expected. The overall SIR was 153.1. The 95 % CI determined that this elevation was statistically significant; 114.7 - 200.3. The fact that this confidence interval is relatively narrow provides a good deal of certainty that this increase is a true elevation. The female SIR was determined to be 151.3. Again, this elevation was determined to be statistically significant; 95 % CI = [112.9 - 198.3].

Census Tract 3738

The breast cancer incidence in census tract 3738 was elevated. However, this elevation was not statistically significant. In total, there were 61 cases observed while 47.5 cases were expected. This represents an SIR of 128.3 (95 % CI = [98.2 - 164.9]). There was one male breast cancer case reported in this census tract for the 1982-1992 time period. The incidence of breast cancer among females was elevated but was not statistically significant (60 observed/ 47.3 expected; SIR = 126.9; 95 % CI = [96.9-163.4]).

Census Tract 3739

Census tract 3739 presented with 68 cases of breast cancer. This represents an elevation over the 57 expected cases. This elevation, however, was not determined to be statistically significant (95 % CI = [92.5 - 151.0]). There were no male cases of breast cancer reported in this census tract between 1982 and 1992. The SIR for breast cancer incidence among females was 119.9, which represents an elevation of 19.9 percent over the number of cases that were expected (68 observed/ 56.7 expected; 95 % CI = [93.2 - 152.1]).

Census Tract 3740

The breast cancer incidence in census tract 3740 was found to be statistically elevated. There were 57 cases observed in this census tract while 42 were expected. This excess of 15 cases was determined to be statistically significant (SIR = 135.7; 95 % CI = [102.8 - 175.8]). There were no male breast cancer cases reported in this census tract for the period 1982-1992. Female breast cancer was also found to be statistically elevated for census tract 3740 (SIR = 136.6; 95 % CI = [103.5 - 177.0]).

Census Tract 3741

The breast cancer incidence in census tract 3741 was determined to be consistent with what was expected for the 1982-1992 time period. There were 34 cases observed while 33.8 were expected. This represents an SIR of 100.5 (95 % CI = [69.6-140.5]). There were no male breast cancer cases reported during this time frame. The SIR for females was 101. There were 34 observed cases among females while 33.6 were expected. Again, this does not represent a statistically significant finding (95 % CI = [70-141.3]).

Census Tract 3742

Census tract 3742 experienced breast cancer at slightly above the rate that was expected. There were 37 cases observed while 34.8 were expected. This represents an elevation of 6.4 percent. However, this elevation was not found to be statistically significant and therefore may be the result of random fluctuation (SIR = 106.4; 95 % CI = [74.9 - 146.7]). These cases were observed in females. There were no male cases of breast cancer reported in this census tract during the 1982-1992 time period. The SIR for females was found to be 107.1, this too was found not to be a statistically significant elevation (95 % CI = [75.4 - 147.7]).

Census Tract 3743

The incidence of breast cancer in census tract 3743 was found to be statistically elevated. There were 43 cases observed while 28 were expected. This represents a statistically significant elevation of breast cancer (SIR = 153.8; 95 % CI = [111.3 - 207.2]). There were no cases of breast cancer reported in this census tract in males. The female breast cancer incidence was also determined to be statistically elevated (43 observed/ 27.8 expected; SIR = 154.9; 95 % CI = [112.1 - 208.6]).

Census Tract 3744

In census tract 3744, the incidence of breast cancer was higher than expected, however, this elevation was not found to be statistically significant. There were 64 cases observed while 51.4 were expected during the 1982-1992 time period. The SIR for this census tract was 124.6; 95 % CI = [95.9 - 159.1]). The elevated incidence of breast cancer

among females was also not statistically significant (64 observed/ 51.1 expected; SIR = 125.3; 95 % CI = [96.5 - 160.0]).

Census Tract 3745

Census tract 3745 experienced less breast cancer than expected. There were 33 cases observed while 41.9 cases were expected (SIR = 78.8; 95 % CI = [54.2 - 110.6]). There were no cases of male breast cancer observed during this time period in census tract 3745. When females were considered separately, the SIR was determined to be 79.2 representing 9 fewer cases than expected, which was not statistically significant (95 % CI = [54.5 - 111.2].

Census Tract 3746

Census tract 3746 presented with fewer breast cancer cases than expected. There were 33 cases observed while 41.4 were expected (SIR = 79.7; 95 % CI = [54.8 - 111.9]). One male breast cancer case was reported in census tract 3746 during the 1982-1992 time period and the female breast cancer SIR in this census tract was 77.7.

Census Tract 3747

Census tract 3747 experienced fewer cases of breast cancer than expected. There were 31 cases of breast cancer observed in this census tract between 1982 and 1992 while 38 cases were expected. This represents an SIR of 81.5.(95 % CI = [55.4 - 115.7]). The incidence of breast cancer among females in census tract 3747 was found to be lower than expected. However, the lower than expected incidence was not statistically significant (SIR = 81.9; 95 % CI = [55.7 - 116.4]). There were no male breast cancer cases reported in this census tract.

Census Tract 3748

There were 30 cases observed in census tract 3748 during the 1982-1992 time period. While 33.6 cases were expected (SIR = 89.3; 95 % CI = [60.3 - 127.5]). There were no male cases reported in this tract during this time frame. The SIR for female breast cancer was 89.8 and was not found to be statistically significant (30 observed/ 33.4 expected; 95 % CI = [60.6 - 128.3]).

C. 1982 - 1986

Census Tract 3731

The incidence of breast cancer in census tract 3731 was elevated for the period 1982-1986. However, this elevation was not statistically significant. There were 21 cases observed while 16.2 cases were expected. This represents 29.4 percent more cases than expected (SIR = 129.4; 95 % CI = [80.1 - 197.9]). There was 1 male case reported among these 21 cases.

Census Tract 3732

In census tract 3732, breast cancer occurred at essentially the rate that was expected during this period. There were 18 cases observed and 17 cases expected. This represents an SIR of 105.5, this finding was not of statistical significance (95 % CI = [62.5 -166.8]). There was one case of male breast cancer reported in this census tract. The female breast cancer incidence was consistent with what was expected, the SIR was 100.2 (95 % CI = [58.3 - 160.4]).

Census Tract 3733

Census tract 3733 experience breast cancer at an elevated rate during the 1982-1986 time period. There were 1.2 excess cases reported. The SIR for this tract for this time period was calculated to be 110.2. This elevation was not found to be statistically significant (95 % CI = [58.6 - 188.4]). There were no male cases of breast cancer reported.

Census Tract 3734

The incidence of breast cancer was found to be higher than expected in census tract 3734. There were 12 cases observed while 9.9 were expected. The overall SIR was 121.8, this is a non statistically significant elevation (95 % CI = [62.9 - 212.8]). There were no male breast cancer cases reported during this time period in this census tract.

Census Tract 3735

More cases of breast cancer occurred in census tract 3735 than expected during the 1982-1986 time period. There were 25 cases observed while 19.2 were expected, this represents an SIR of 129.8. This elevation was not statistically significant (95 % CI = [84.0 - 191.7]). There were no cases of male breast cancer reported in this census tract during this time frame. The SIR for female cases was also found to be not statistically elevated (SIR = 130.6; 95 % CI = [84.5 - 192.8]).

Census Tract 3736

Breast cancer incidence was elevated in census tract 3736 for the 1982-1986 time period. There were 24 cases observed while 17.3 cases were expected. This represents an SIR of 138.9. This elevation was not statistically significant (95 % CI = [88.9 - 206.6]). There were no cases of male breast cancer reported in this census tract. The SIR for females was also not statistically elevated (SIR = 139.7; 95 % CI = [89.5 - 207.9]).

Census Tract 3737

Breast cancer was found to be elevated in census tract 3737 for the 1982-1986 time period. This elevation was determined to be statistically significant. There were 27 cases observed while 14.4 were expected (SIR = 187.5; 95 % CI = [123.5 - 272.8]). There was one case of male breast cancer reported in this census tract during this time period. Statistical significance was not evaluated for male breast cancer due to the same number of observed cases. The breast cancer incidence for females was statistically elevated. There were 26 cases observed while 14.3 were expected (SIR = 181.6; 95 % CI = [118.6 - 266.2]).

Census Tract 3738

In census tract 3738 there were 1.2 additional cases of breast cancer observed over what was expected for this time period. There were 21 observed cases while 19.8 were expected. This represents an SIR of 106.2. This elevation was not found to be statistically significant (95 % CI = [65.7 - 162.3]). The female breast cancer incidence was also found to be elevated although it was not statistically significant (SIR = 106.7; 95 % CI = [66.0 - 163.1]). There were no male breast cancer cases observed in this census tract for this time period.

Census Tract 3739

Census tract 3739 experienced more cases of breast cancer than what was expected during this time period. There were 33 cases observed and 23.7 expected. This represents an SIR of 139.1. This elevation was not found to be statistically significant (95 % CI = [95.7 - 195.4]). These 33 cases occurred in females. The female incidence was determined to be not statistically elevated (SIR = 140.0; 95 % CI = [96.4 - 196.7]).

Census Tract 3740

Breast cancer was elevated in census tract 3740, however, this elevation was not statistically significant. There were 25 cases observed while 17.4 cases were expected. This represents an SIR of 143.8 (95 % CI = [93.1 - 212.4]). There were no male cases reported in this tract during this time period. The SIR for females considered separately was 144.8. This too was not a statistically significant elevation (95 % CI = [93.7 - 213.7]).

Census Tract 3741

In census tract 3741, there was one additional case than what was expected for the years 1982-1986. This represents an overall SIR of 106.3. This was not a statistically significant elevation (95 % CI = [59.5 - 175.4]). There were no male cases of breast cancer in this census tract. Females experienced a slight but non-statistically significant elevation of breast cancer in this census tract (SIR = 106.9; 95 % CI = [59.8 - 176.2]).

Census Tract 3742

Census tract 3742 experienced breast cancer at a slightly elevated rate. There were 17 cases observed while 14.4 were expected. This represents an SIR of 117.8. This elevation was not found to be significantly elevated (95 % CI = [68.6 - 188.6]). There were no male cases observed during the period 1982-1986 in this census tract. The female breast cancer incidence was elevated but not statistically significant (95 % CI = [68.9 - 189.7]).

Census Tract 3743

In census tract 3743 during the years 1982-1986, 7.4 additional cases were observed than what was expected. There were 19 cases observed while 11.6 cases were expected. These 19 cases were diagnosed in females. There were no male breast cancer cases reported in this census tract during this time period. The SIR for females considered separately was 165.1, this elevation was not statistically significant (95 % CI = [99.4 - 257.9].

Census Tract 3744

Overall, a statistically significant elevation of breast cancer was observed in census tract 3744 during the years 1982-1986. There were 37 cases observed while 21.6 were expected. This represents an SIR of 171.4 (95 % CI = [120.7 - 236.3]). These cases were observed in females and therefore the SIR for females considered separately was determined to be 172.4. This too represents a statistically significant elevation (95 % CI = [121.3 - 237.6]).

Census Tract 3745

In census tract 3745, breast cancer occurred at essentially the same rate that was expected during this time period. There were 17 cases observed while 17.6 cases were expected. The SIR was determined to be 96.7 and was not determined to be statistically significant (95 % CI = [56.3 - 154.8]). The female incidence of breast cancer was also consistent with what was expected (SIR = 97.2; 95 % CI = [56.6 - 155.6]).

Census Tract 3746

The incidence of breast cancer was found to be statistically significantly lower than expected during 1982-1986 for census tract 3746. There were 8 cases observed while 17.2 cases were expected. SIR=46.9; 95% CI = [20.1 -91.9]). There were no male breast cancer cases reported in this tract.

Census Tract 3747

There were fewer cases of breast cancer observed in census tract 3747 during this time period. The overall SIR was 75.8 (12 observed/ 15.8 expected) and was not statistically significant (95 % CI = [39.1 - 132.4]). The SIR for females taken separately was 76.2. There were no male breast cancers reported for this census tract.

Census Tract 3748

In census tract 3748, there were 15 cases of breast cancer observed while 14.1 were expected. This represents a non-statistically significant elevation (SIR = 106.1; 95 % CI = [59.4 - 175.1]). There were no cases of male breast cancer reported in this census tract for this period of time. The female breast cancer SIR was 106.7. This too was not statistically significant (95 % CI = [59.7 - 176.0]).

D. 1987 - 1992

Census Tract 3731

The incidence of breast cancer in census tract 3731 for the period 1987-1992 was lower than what was anticipated for that period. The overall SIR for this census tract for this time frame was 74.8 (17 observed/ 22.7 expected). This is lower than the SIR for this tract during the 1982-1986 time period. However, this was not statistically significant (95 % CI = [43.5 - 119.7]). There were no male cases of breast cancer observed during this period. The SIR for females was 75.2.

Census Tract 3732

The SIR for census tract 3732 for the 1987-1992 time period was 104.5. This finding is consistent with the SIR for this census tract during the 1982-1986 time period. There were 25 cases observed while 23.9 cases were expected between 1987 and 1992. These cases were all observed among females, there were no male cases reported in this census tract from 1987-1992. The SIR for females was 105.2. This is a non-statistically significant elevation (95 % CI = [68.0 - 155.3]).

Census Tract 3733

Breast cancer occurred below the level that was expected in census tract 3733 between 1987 and 1992. There were 13 cases observed and 16.4 cases expected (SIR = 79.1; 95 % CI = [42.1 - 135.3]). This SIR is lower than that observed during the 1982-1986 period (SIR = 110.2). There were no male cases of breast cancer reported in this census tract during the 1987-1992 time frame. The female SIR was determined to be 79.5. This was not statistically significant (95 % CI = [42.3 - 136.0]).

Census Tract 3734

Breast cancer was found to be slightly elevated in this census tract for the period 1987-1992 (SIR = 108.4). This elevation was not statistically significant (95 % CI = [60.6 - 178.7]). The elevation of breast cancer for this time period is less than that of the 1982-1986 time period (SIR = 121.8). There was one male breast cancer case reported during the 1987-1992 time period while none were reported in the early time period. Females experienced breast cancer at essentially the same rate as that which was expected (14 observed/ 13.8 expected; SIR = 101.7). This is a non-statistically significant elevation (95 % CI = [55.6 - 170.7]).

Census Tract 3735

There were 19 cases of breast cancer observed in this census tract during the 1987-1992 period while 27.2 percent were expected (SIR = 69.8; 95 % CI = [42.0 - 109.1]). This SIR is lower than the SIR for the same tract during the 1982-1986 time

period (SIR = 129.8). There were 2 cases of male breast cancer in this census tract during the 1987-1992 time period and 0.18 were expected. Statistical significance could not be assessed due to the small number of observed cases. There were 17 female cases reported for this census tract during this period while 27.0 were expected (SIR = 62.9; 95 % CI = [36.6 - 100.7]).

Census Tract 3736

Census tract 3736 presented with 24 cases while 24.1 were expected during the 1987-1992 timeperiod (SIR = 99.5; 95 % CI = [63.8 - 148.1]). This SIR was lower than the SIR for this census tract for the 1982-1986 time perod (138.9). There were no cases of male breast cancer reported in this census tract. The SIR for females was 100.2 which is consistent with what was expected (95 % CI = [64.2 - 149.1]).

Census Tract 3737

In census tract 3737, breast cancer incidence was elevated but not found to be statistically significant. The overall SIR was 128.9 (26 observed/ 20.2 expected; 95 % CI = [84.2 - 188.9]). The same census tract experienced a statistically significant elevation for the 1982-1986 time period (SIR = 187.5). The SIR for female cases was elevated but not found to be statistically significant (SIR = 129.8; 95 % CI = [84.8 - 190.2]). This is in contrast to the statistically significant elevation observed among females during the 1982-1986 time period (SIR = 181.6).

Census Tract 3738

Census tract 3738 presented with a statistically significant elevation of breast cancer during the 1987-1992 time period. The breast cancer incidence was elevated by 44.6 percent (40 observed/ 27.7 expected; SIR = 144.6; 95 % CI = [103.3 - 197.0]). The same census tract did not experience a statistically significant elevation during the 1982-1986 time period (SIR = 106.2). There was one male breast cancer case reported for this time period in this tract, there were no male cases reported in the early time period. Breast cancer was also found to be statistically significantly elevated in females in this tract. There were 39 cases observed while 27.5 were expected. This represents an SIR of 141.9 (95 % CI = [100.9 - 194.0]).

Census Tract 3739

The 1987-1992 incidence for census tract 3739 indicates that a non-statistically significant elevation of breast cancer occurred. There were 35 cases observed while 33.3 cases were expected (SIR = 105.1; 95 % CI = [73.2 - 146.2]). These 35 cases were observed in females with no male cases being reported. The SIR for females was consistent with that for the entire census tract (SIR = 105.9; 95 % CI = [73.7 - 147.3]).

Census Tract 3740

Breast cancer occurred above the expected rate for census tract 3740 during the 1987-1992 time period. There were 32 cases observed while 24.6 were expected. This represents an SIR of 130.2 (95 % CI = [89.0 - 183.8]). There were no male breast cancer cases reported in this census tract during this time period. The SIR for female breast cancer was 131.1 (32 observed/ 24.4 expected; 95 % CI = [89.7 - 185.1]). The findings in this census tract were similar to that observed during the 1982-1986 time period.

Census Tract 3741

Breast cancer incidence was consistent with what was expected in census tract 3741 for the 1987-1992 time frame. There were 19 cases observed while 19.6 were expected (SIR = 96.7). This was not found to be statistically significant (95 % CI = [58.2 - 151.1]). There were no male breast cancer cases observed in this tract during this time period. The SIR when females were considered separately was 97.3 again representing a slightly lower than expected ratio. This census tract experienced breast cancer at a slightly elevated but not statistically significant rate during the 1982-1986 time period (SIR = 106.3; 95 % CI = [59.5 - 175.4]).

Census Tract 3742

Census tract 3742 experienced breast cancer at a rate consistent with what was expected for the 1987-1992 time period. There were 20 cases observed while 20.3 were expected (SIR = 98.6; 95 % CI = [60.2 - 152.3]). These 20 cases occurred in females. The SIR for females considered separately was also found to be consistent with what was expected (99.3; 95 % CI = [60.6 - 153.4]). The same census tract presented with more cases than anticipated for the 1982-1986 period (17 observed/ 14.4 expected; SIR = 117.8; 95 % CI = [68.6 - 188.6]).

Census Tract 3743

The breast cancer incidence in census tract 3743 was elevated for the 1987-1992 time period. This elevation was not found to be statistically significant. There were 24 cases observed while 16.4 were expected (SIR = 146.7; 95 % CI = [94.0 - 218.3]). This elevation is less than the elevation observed in the same census tract for the 1982-1986 time period (19 observed/ 11.6 expected; SIR = 164.1]). There were no male breast cancer cases reported in this tract during this time period. The SIR for females is consistent with that observed for the entire census tract.

Census Tract 3744

Breast cancer occurred at a lower rate than expected for the 1987-1992 time period. There were 27 cases observed while 29.7 were expected (SIR = 90.9; 95 % CI = [59.9 - 132.2]). This census tract experienced a statistically significant elevation of breast cancer for the 1982-1986 time period (SIR = 171.4; 95 % CI = [120.7 - 236.3]). There

were no breast cancer cases reported among males during either time period. The female breast cancer incidence was lower than expected during the 1987-1992 time period (SIR = 91.5), and was statistically significantly elevated during the 1982-1986 time period (SIR = 172.4).

Census Tract 3745

Census tract 3745 experienced fewer cases of breast cancer than expected during the 1987-1992 time period. There were 16 cases reported while 24.2 were expected. This represents an SIR of 66.0 (95 % CI = [37.7 - 107.2]). During the 1982-1986 time period breast cancer occurred at essentially the same rate that was expected (SIR = 96.7). There were no male breast cancer cases reported during either of the time periods for this census tract. Breast cancer among females was consistent with what was observed for the entire census tract during both time periods.

Census Tract 3746

Breast cancer was elevated in census tract 3746 during the 1987-1992 time period. There were 25 cases observed while 24.2 were expected. This represents a non-statistically significant elevation of approximately 3 percent (SIR = 103.3; 95 % CI = [66.8 - 152.5]). This same census tract experienced breast cancer significantly less often than expected during the 1982-1986 period of time (SIR = 46.6). There was one male breast cancer case observed in this tract during the 1987-1990 time period. Statistical significance could not be assessed for this case due to the small number of observed cases. The incidence among females was found to be consistent with what was expected during the 1987-1990 time period (SIR = 99.8; 95 % CI = [63.9 - 148.6]). Females presented with a significantly lower rate of breast cancer in this census tract during the 1982-1986 time frame (SIR = 46.9).

Census Tract 3747

Breast cancer presented at a lower rate than expected in census tract 3747 for the 1987-1992 time period. The SIR for the entire census tract was 85.9. This represents 3.1 fewer cases than anticipated. This decrease was not found to be statistically significant (95 % CI = [51.7 - 134.2]). This census tract also experienced fewer cases than anticipated during the 1982-1986 time period (SIR = 75.8). There were no male breast cancer cases reported in this census tract. The incidence of breast cancer among females was consistent with what the entire census tract experienced (SIR = 86.4).

Census Tract 3748

There were fewer breast cancer cases observed in census tract 3748 than expected for the 1987-1992 time period (15 observed/ 19.4 expected; SIR = 77.4; 95 % CI = [43.3 - 127.7]). This census tract experienced more cases than expected during the 1982-1986 time period (15 observed/ 14.1 expected; SIR = 106.1). No male breast cancer cases were

reported in this census tract during either time period. The breast cancer incidence for females was similar to that observed in the census tract as a whole during this time period (15 observed/ 19.3 expected; SIR = 77.9; 95 % CI = [43.6 - 128.5]).